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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/330,096	06/11/1999	JUN ENOMOTO	1110-0240P	8973

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EXAMINER	
MISLEH, JUSTIN P	
ART UNIT	**PAPER NUMBER**
2612	

DATE MAILED: 06/02/2004 13

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)	
	09/330,096	ENOMOTO, JUN	
	Examiner	Art Unit	
	Justin P Misleh	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 April 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 - 10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 June 1999* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to Claims 1 – 10 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. **Claims 1 – 10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sekine et al. in view of Yamaguchi et al.

4. For **Claim 1**, Sekine et al. disclose, as shown in figures 1 and 2, a digital image shooting device, comprising:

an image forming zoom lens (zoom lens 12);

an image sensor element (solid-state image sensors 14, 16, and 18);

a data processing unit for processing an output signal from said image sensor element (14, 16, and 18) into digital image data (see description **A** below);

an image memory (video tape) for storing the digital image data (color video output) and a lens characteristic (aberration information code) relating to the image forming lens (zoom lens 12; see description **B** below);

a lens characteristic correction unit (figure 2 and as stated in column 4, lines 9 – 13 and 18 – 27) for performing, by using the stored lens characteristic of said image forming lens and a position of a frame image photographed (stored in the video tape), a process of correcting a position of a frame image photographed (by means of image memory 38), a process of correcting a deterioration of an image quality derived from said image forming lens upon the entire digital image data (by means of computing circuit 40);

wherein the image quality deterioration corrected by the lens characteristic correction unit (figure 2) is at least one of a chromatic aberration of magnification, defocusing, and a decrease in marginal lumination (see descriptions **C** + **D** below).

Sekine et al. purpose is to design a camera that is small in size and light in weight and therefore the lens characteristic correction unit is configured in a separate apparatus (see figure 2). Moreover, Sekine et al. states (column 4, lines 65 and 66) that the process of correcting image quality does not have to be carried out in real time. Therefore, Sekine et al. does not disclose a process of correcting image quality before the shooting of a next frame of an image or during the shooting of the next frame onward.

On the other hand, Yamaguchi et al. also disclose a digital image shooting device that is concerned with correcting image quality. More specifically, Yamaguchi et al. disclose, as shown in figure 8 and as stated in columns 5 (lines 59 – 67), 6 (lines 1 – 15), 9 (lines 57 – 67), and column 10 (lines 1 – 19), an image processor (30B) for use in a digital image shooting device (see figure 8) that is provided to correct distortions of the central portion of an image due to an optical system. Furthermore, Yamaguchi et al. only teach of real time image correction, as indicated by the design and placement of the image processor <u>within</u> the digital image shooting

device (30B; see column 1, lines 50 – 67, and column 6, lines 11 - 16). In other words, Yamaguchi et al. teach a process of correcting image quality before the shooting of a next frame of an image or during the shooting of the next frame onward.

As stated in columns 3 (lines 40 – 52) and 10 (lines 1 – 20), at the time the invention was made, one with ordinary skill in the art would have been motivated to include an image processor to correct distortions due to an optical system in an image in real time, as taught by Yamaguchi et al., in the digital image shooting device, disclosed by Sekine et al., as a means to provide a process of image correction that is capable of producing central portions of images at high quality and entire marginal portions of images while realizing a correction circuit that is simple, small, and low cost. Therefore, at the time the invention was made, it would have been obvious to one with ordinary skill in the art to have included an image processor to correct distortions due to an optical system in an image in real time, as taught by Yamaguchi et al., in the digital image shooting device, disclosed by Sekine et al.

5. As for **Claim 2**, Sekine et al. disclose the digital image shooting device according to Claim 1 wherein said image quality deterioration further includes a distortion aberration (see descriptions **C** + **D** below).

6. As for **Claim 3**, Sekine et al. disclose a digital image shooting device according to Claim 1 wherein the lens correction unit (figure 2) corrects the deterioration of the image quality. However, Sekine et al. is silent with respect to a process of compressing the digital image data. <u>Official Notice</u> is taken that both the concepts and advantages of compressing the digital image data are well know and expected in the art. Since, at the time the invention was made, loss less compression is impossible, it would have been obvious to compress the corrected digital image

data to prevent deterioration of the aberration information code and further deterioration of image quality.

7. As for **Claim 4**, Sekine et al. disclose the digital image shooting device according to Claim 1 wherein the lens characteristic unit (figure 2) performs correction before the photographing of a next frame or during the photographing of the next frame onward. Sekine et al. disclose a digital image shooting device that operates in real time with the option of operating the digital image shooting device not in real time, as indicated in column 4 (lines 64 – 66). Also Sekine et al. disclose, as stated in column 6 (lines 13 – 18), that the digital image data (color video output) of the frame that performed the correction by the lens characteristic unit (figure 2) is stored in said image memory (video tape).

8. As for **Claim 5**, Sekine et al. disclose the digital image shooting device according to Claim 1, wherein said image memory is a built-in image recording medium or a removable image recording medium (see column 3, lines 13 – 15).

9. As for **Claim 6**, Sekine et al. disclose the digital image shooting device according to Claim 1, further comprising an image display unit (see figure 2) for displaying the photographed image, wherein an image based on the digital image data **which is** or is not performed the correction process in said lens characteristic correction unit (see figure 2), is displayed on said image display unit, and the digital image data performed the correction process in said lens characteristic correction unit (see figure 2), is stored in a memory (image memory 38).

10. As for **Claim 7**, Sekine et al. disclose the digital image shooting device according to Claim 1 wherein an image of a region larger than a photographic region confirmed by a photographer is formed on said image sensor element (14, 16, and 18) in accordance with

missing of pixels which is caused as a result of the correction by said lens characteristic correction unit (figure 2). As stated in column 4 (lines 50 – 56), the correction performed by the lens characteristic unit (figure 2) involves interpolation between adjacent picture elements.

11. As for **Claim 8**, Sekine et al. disclose a single image formation lens (zoom lens 12) with potentiometers (24, 26, and 28). The potentiometers (24, 26, and 28) detect the object distance, focal length, aperture value of the iris of the zoom lens (12), respectively. An A/D (30) is arranged to digitize the outputs of the potentiometers (24, 26, and 28). The digitized potentiometer (24, 26, and 28) outputs are provided to a digital microcomputer (34), which compares them to tabular codes stored in ROM (32) to generate a digital aberration information code to be recorded with the color video output, on a video tape, in the recording circuit (22). Therefore, for each new object distance, focal length, and/or aperture value of the iris of the zoom lens (12), a new aberration information code is generated and recorded together with the color video output. Since, Sekine et al. disclose the generation of the aberration information code from the aberration information of three potentiometers (24, 26, and 28) and the tabular codes provided in ROM (32), at the time the invention was made, one with ordinary skill in the art would have been motivated to include a plurality of image forming lenses, rather than a single image forming lens, wherein each image forming lens is provided with three potentiometers to provide aberration information to the ROM (32). Therefore, at the time the invention was made, it would have been obvious to one with ordinary skill in the art to have included a plurality of image forming lenses.

12. For **Claim 9**, Sekine et al. disclose a digital image shooting device, comprising:

an image forming zoom lens (zoom lens 12);

an image sensor element (solid-state image sensors 14, 16, and 18);

a data processing unit for processing an output signal from said image sensor element (14, 16, and 18) into digital image data (see description **A** below);

an image memory (video tape) for storing the digital image data (color video output) and a lens characteristic (aberration information code) relating to a plurality of focal lengths (see description **B** below) of the zoom lens (12);

a lens characteristic correction unit (figure 2 and as stated in column 4, lines 9 – 13 and 18 – 27) for performing, by using the stored lens characteristic of said image forming lens and a position of a frame image photographed (stored in the video tape), a process of correcting a position of a frame image photographed (by means of image memory 38), a process of correcting a deterioration of an image quality derived from said image forming lens upon the entire digital image data (by means of computing circuit 40);

wherein the lens characteristic (aberration information code) is converted at the plurality of focal lengths to the focal length when the image is photographed (see description **B** below).

Sekine et al. purpose is to design a camera that is small in size and light in weight and therefore the lens characteristic correction unit is configured in a separate apparatus (see figure 2). Moreover, Sekine et al. states (column 4, lines 65 and 66) that the process of correcting image quality does not have to be carried out in real time. Therefore, Sekine et al. does not disclose a process of correcting image quality before the shooting of a next frame of an image or during the shooting of the next frame onward.

On the other hand, Yamaguchi et al. also disclose a digital image shooting device that is concerned with correcting image quality. More specifically, Yamaguchi et al. disclose, as shown

in figure 8 and as stated in columns 5 (lines 59 – 67), 6 (lines 1 – 15), 9 (lines 57 – 67), and column 10 (lines 1 – 19), an image processor (30B) for use in a digital image shooting device (see figure 8) that is provided to correct distortions of the central portion of an image due to an optical system. Furthermore, Yamaguchi et al. only teach of real time image correction, as indicated by the design and placement of the image processor within the digital image shooting device (30B; see column 1, lines 50 – 67, and column 6, lines 11 - 16). In other words, Yamaguchi et al. teach a process of correcting image quality before the shooting of a next frame of an image or during the shooting of the next frame onward.

As stated in columns 3 (lines 40 – 52) and 10 (lines 1 – 20), at the time the invention was made, one with ordinary skill in the art would have been motivated to include an image processor to correct distortions due to an optical system in an image in real time, as taught by Yamaguchi et al., in the digital image shooting device, disclosed by Sekine et al., as a means to provide a process of image correction that is capable of producing central portions of images at high quality and entire marginal portions of images while realizing a correction circuit that is simple, small, and low cost. Therefore, at the time the invention was made, it would have been obvious to one with ordinary skill in the art to have included an image processor to correct distortions due to an optical system in an image in real time, as taught by Yamaguchi et al., in the digital image shooting device, disclosed by Sekine et al.

13. For **Claim 10**, Sekine et al. disclose a digital image shooting device, comprising:

an image forming lens (zoom lens 12);

an image sensor element (solid-state image sensors 14, 16, and 18) optically coupled to said lens;

a data processing unit operatively connected to said image sensor element (14, 16, and 18) and receiving an output signal from said image sensor element (14, 16, and 18) and converting the output signal into digital image data (see description **A** below);

an image memory (video tape) operatively connected to said data processing unit, the digital image data (color video output) and a lens characteristic (aberration information code) relating to the image forming lens (zoom lens 12) being stored in said image memory (video tape; see description **B** below);

a lens characteristic correction unit (figure 2 and as stated in column 4, lines 9 – 13, 18 – 27, and 50 – 56 and column 6, lines 31 – 36) operatively connected to said image memory (video tape), said lens characteristic correction unit (figure 2) correcting a deterioration of an image quality derived from said image forming lens (zoom lens 12) upon the digital image data (color video output) by using the stored lens characteristic of said image forming lens (zoom lens 12) and a position of a frame image photographed (stored in the video tape);

wherein the image quality deterioration corrected by the lens characteristic correction unit (figure 2) is a distortion aberration and a chromatic aberration of magnification (see description **C** below).

Sekine et al. purpose is to design a camera that is small in size and light in weight and therefore the lens characteristic correction unit is configured in a separate apparatus (see figure 2). Moreover, Sekine et al. states (column 4, lines 65 and 66) that the process of correcting image quality does not have to be carried out in real time. Therefore, Sekine et al. does not disclose a process of correcting image quality before the shooting of a next frame of an image or during the shooting of the next frame onward.

On the other hand, Yamaguchi et al. also disclose a digital image shooting device that is concerned with correcting image quality. More specifically, Yamaguchi et al. disclose, as shown in figure 8 and as stated in columns 5 (lines 59 – 67), 6 (lines 1 – 15), 9 (lines 57 – 67), and column 10 (lines 1 – 19), an image processor (30B) for use in a digital image shooting device (see figure 8) that is provided to correct distortions of the central portion of an image due to an optical system. Furthermore, Yamaguchi et al. only teach of real time image correction, as indicated by the design and placement of the image processor <u>within</u> the digital image shooting device (30B; see column 1, lines 50 – 67, and column 6, lines 11 - 16). In other words, Yamaguchi et al. teach a process of correcting image quality before the shooting of a next frame of an image or during the shooting of the next frame onward.

As stated in columns 3 (lines 40 – 52) and 10 (lines 1 – 20), at the time the invention was made, one with ordinary skill in the art would have been motivated to include an image processor to correct distortions due to an optical system in an image in real time, as taught by Yamaguchi et al., in the digital image shooting device, disclosed by Sekine et al., as a means to provide a process of image correction that is capable of producing central portions of images at high quality and entire marginal portions of images while realizing a correction circuit that is simple, small, and low cost. Therefore, at the time the invention was made, it would have been obvious to one with ordinary skill in the art to have included an image processor to correct distortions due to an optical system in an image in real time, as taught by Yamaguchi et al., in the digital image shooting device, disclosed by Sekine et al.

Descriptions

A. Sekine et al. is silent with regard to a data processing unit for generating digital image data, however, a video signal processing circuit (20) is provided, which performs known processes on the outputs of the image sensor element. A recording circuit (22) records the color video output of the video signal processing circuit (20) on a video tape together with an aberration information code which is digitized and provided by a ROM (32). Thus, since the aberration information code is recorded together with the color video output onto the video tape, it is inherent that either the known processes performed by the video processing circuit (20) or the recording circuit (22) at least include a step to digitize the color video output. If the color video output were not digitized, it would be impossible to record it together with the digitized aberration information code on the video tape.

B. Sekine et al. disclose, as stated in column 3 (lines 34 – 36 and 49 – 67), an aberration information code, which has been digitized by the A/D (30). The aberration information provided to the A/D (30) is generated by the potentiometers (24, 26, and 28) of the zoom lens (12). The potentiometers (24, 26, and 28) detect the object distance, focal length, aperture value of the iris of the zoom lens (12), respectively. An A/D (30) is arranged to digitize the outputs of the potentiometers (24, 26, and 28). The digitized potentiometer (24, 26, and 28) outputs are provided to a digital microcomputer (34), which compares them to tabular codes stored in ROM (32) to generate a digital aberration information code to be recorded with the color video output, on a video tape, in the recording circuit (22). Therefore, for each new object distance, focal length, and/or aperture value of the iris of the zoom lens (12), a new aberration information code is generated and recorded together with the color video output.

C. Chromatic aberration of magnification is caused by a difference in light wavelength. The focal length or magnification of a lens varies according to the wavelength of each type of incident light. Sekine et al. clearly states, in column 3, that the focal length of the zoom lens (12) at the time of shooting the image is included in the aberration information code. Thus, chromatic aberration of magnification is corrected. Marginal lumination is a drop in brightness at the edges of a photograph. Sekine et al. also clearly states, in column 3, that the aperture value of the iris of the zoom lens (12) at the time of shooting the image is included in the aberration information code. Thus, marginal lumination is corrected. Distortion aberration is inherent to all lenses. The aberration information code includes a plurality of aberration information of the zoom lens (12), also as clearly stated in column 3. Thus, as indicated in Sekine et al., in column 6 (lines 31 – 36), image distortion is corrected in accordance with aberration information which indicates any aberration that takes place at the time of shooting wherein image distortion results from the aberration of the photo-taking lens (12). Therefore, Sekine et al. corrects for a distortion aberration, chromatic aberration of magnification, and marginal lumination.

D. Claim 1 requires **at least one of a** chromatic aberration of magnification, defocusing, and a decrease in marginal lumination. Thus, since Sekine et al. disclose the correction of chromatic aberration of magnification and decrease in marginal lumination, individually and combined. Sekine et al. disclose at least one of a chromatic aberration of magnification, defocusing, and a decrease in marginal lumination.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Justin P Misleh whose telephone number is 703.305.8090. The Examiner can normally be reached on Monday through Thursday from 7:30 AM to 5:30 PM and on alternating Fridays from 7:30 AM to 4:30 PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Wendy R Garber can be reached on 703.305.4929. The fax phone number for the organization where this application or proceeding is assigned is 703.872.9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JPM
May 19, 2004

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